**Registration form for Polish research institution**

1. Research institution data (name and address):

Jagiellonian University in Cracow
ul. Gołębia 24, 31-007 Kraków
Faculty of Mathematics and Computer Science
ul. Prof. S. Łojasiewicza 6,
30-348 Kraków

2. Type of research institution:

   1) <u>basic organisational unit of higher education institution</u>

3. Head of the institution:

Vice-Rector for Research and Structural Funds Prof. dr hab. Stanisław Kistryn

4. Contact information of designated person(s) for applicants and the NCN: first and last name, position, e-mail address, phone number, correspondence address):

Prof. dr hab. Włodziemierz Zwonek,
position: Dean of the JU Faculty of Mathematics and Computer Science,
e-mail address: Wlodzimierz.Zwonek@uj.edu.pl, <u>matinf@uj.edu.pl</u>
phone number: 12 664 6630, 12 664 6629
correspondence address: ul. Prof. S. Łojasiewicza 6, 30-348 Kraków

5. Research discipline in which the strong international position of the institution ensures establishing a Dioscuri Centre:

Natural Sciences and Technology

☐ **<u>Mathematics</u>**

6. Description of important research achievements from the selected discipline from the last 5 years including a list of the most important publications, patents, other (*up to one page in A4 format*):

**1.** Zbigniew Błocki, *Suita conjecture and the Ohsawa-Takegoshi extension theorem*, Invent. Math. vol. 193 (2013), 149–158.

**2.** Sławomir Dinew, Sławomir Kołodziej, *Liouville and Calabi-Yau type theorems for complex Hessian equations*, Am J. Math. vol. 139 (2017), 403–415.

**3.** Wojciech Kucharz, *Approximation by continuous rational maps into spheres*, J. Eur. Math. Soc. vol. 16 (2014), 1555–1569..

**4**. Bilski, M., Parusiński, A., Rond, G., *Local topological algebraicity of analytic function germs,* J. Algebraic Geom. 26 (2017), no. 1, 177–197.

**5.** L.Barto, M. Kozik, *Constraint satisfaction problems solvable by local consistency methods*, J. ACM 61 (2014).

**6**. Śmieja, M., Struski, Ł., Tabor, J., Zieliński, B., Spurek, P., *Processing of missing data by neural networks*, Advances in Neural Information Processing Systems 32, 2018.

**7**. Atanas Iliev, Grzegorz Kapustka, Michał Kapustka, Kristian Ranestad, *EPW cubes*, J Reine Angew. Math. (2018), 25 p.

**8**. Marian Mrozek, *Conley-Morse-Forman theory for combinatorial multivector fields on Lefschetz complexes*, Found. Comput. Math. vol. 17 (2017), 1585–1633.


**Asymmetric numeral systems** (ANS) – entropy coding methods introduced by **Jarosław Duda** and used in data commmpresion since 2014, among others by the Facebook Zstandard compressor, Apple LZFSE compressor, Google Draco 3D compressor, DNA CRAM 3.0 compressor of SAMtools utilities and is being considered for use in the AV1 open video coding format.


**Most important prizes:**

- S. Kołodziej, Stefan Bergman Prize, 2016. The most important international prize in complex analysis, awarded by the American Mathematical Society.

- W. Kucharz, an invited speaker at the International Congress in Mathematics in Rio de Janeiro (Brasil) in 2018.

- P. Zgliczyński, Hugo Steinhaus Prize, 2017.

- S. Dinew, Szolem Mandelbrojt Prize, 2017.

- A. Szymusiak, the International Stefan Banach Prize for a Doctoral Dissertation in the Mathematical Sciences, 2017.

- Five Maestro grants held at the Department of Mathematics of Jagiellonian University during last five years (PI: P. Zgliczyński, M. Mrozek, P. Idziak, S. Kołodziej, S. Migórski); total amount of funding: PLN 11 120 306 (approx. EUR 2 600 000).

7. List of no more than 3 important research projects from the selected discipline awarded in national and international calls to the institution in the last 5 years (title, name of PI, source of funding, amount of funding):

*Nonsmooth Contact Dynamics*

*Stanisław Migórski*

*Project ID: 823731, funded under: H2020, MSCA-RISE-2018, EU contribution: EUR 644 000.*

*Pluripotential Theory and dbar*

Zbigniew Błocki

Ideas Plus, 001/ID3/2014/63, funded by the Polish Ministry of Science, amount of funding: PLN 1 325 300 (approx. EUR 310 000).

*Metody geometryczne i komputerowo wspierane dowody w dynamice równań różniczkowych cząstkowych (Geometric methods and computer assisted proofs in PDE dynamics)*

Piotr Zgliczyński

Maestro, 2016/22/A/ST1/00077, funded by National Science Centre, Poland, amount of funding: PLN 1 758 900 (approx. EUR 410 000)

8. Description of the available laboratory and office space for the Dioscuri Centre (*up to one page in A4 format*):

The Department of Mathematics and Computer Science is located in a modern building (constructed in 2008) in the new science campus of the Jagiellonian University. The building is fully equipped with all the modern infrastructure and has a sizeable library.

The total area of the building is 19 551 square metres, which allows for very ample office space to be available for use of the newly established Dioscuri Centre. The building has a number of large lecture rooms (up to 248 people) as well as many smaller seminar rooms equipped with computers and video projectors. The department also has a computational grid that is freely available to the faculty. Faculty members have access to a wide range of scientific journals and databases including e.g. Mathscinet and Zentralblatt.

The building is located about 4 km from the historical centre of Krakow and 13 km from a major international airport. The site is easily accessible by public transportation, including a fast tram network.

9. List of the available research equipment for the Dioscuri Centre:

The department has a computational grid with 288 cores and 576 GB RAM that is freely available to the faculty and students.

Furthermore, the Academic Computing Centre Cyfronet is also located in Krakow. Cyfronet is the largest supercomputing and networking centre in Poland and is an administrator of the Prometheus supercomputer. Prometheus has 2,4 Pflops of theoretical performance and was recently listed as the 59th fastest supercomputer in the world. According to Cyfronet's regulations, the computing resources of the centre are available principally to scientific institutions located in Krakow.

10. List of the additional benefits (other than listed in call text) that the Institution declares to provide for the Dioscuri Centre (i.e.: additional funds, personal benefits, other) (*up to one page in A4 format*):

Jagiellonian University owns a number of residential buildings at prestigious locations in the centre of Krakow with appartments available for rent for the Dioscuri Centre leader.

Jagiellonian University offers its employees a rich social benefits programme and a large number of cultural and sports events available to the employees free of charge or at reduced prices, including:

❿ Access to the JU kindergarten and nursery (located at the campus of the university),
❿ JU resort hotel rooms (Zakopane, Rabka, Ustroń k. Wisły),
❿ Language courses at the Jagiellonian Language Centre,
❿ Paid holidays and extra holiday benefits,
❿ Access to the Multisport programme (50% cost coverage by the JU),
❿ Trips organized by the JU.

Jagiellonian University also offers administrative support. This includes:

❿ Project Centre (CAWP) - provides information concerning current research grant opportunities as well as formal support in preparing grant applications
❿ Welcome Centre – provides help in all practical and formal matters related to your arrival in Poland,
❿ Technology Transfer Centre (CITTRU) – offers support in all matters concerning Intellectual Property Rights (IPR).

11. Other information about the internationalisation of the research institution, international researchers employed at the institution, the availability of English language seminars etc. (*up to one page in A4 format*):

The Department of Mathematics and Computer Science cooperates closely with a wide range of  institutions outside of Poland and offers teaching in both Polish and English. 12 faculty members have obtained their PhD from a foreign scientific institution and further 4 faculty members have obtained their habilitation degree from a foreign scientific institution.

The Institute of Mathematics offers in the winter term of 2018/19 a total of 11 courses in English available for undergraduate and graduate students. There is a total of 15 research seminars in mathematics which are run in English unless everyone present is a native Polish speaker. In the years 2013-18 the department employed 11 visiting professors whose main affiliations were at foreign scientific institutions.

Jagiellonian University is also a co-beneficiary (besides Masaryk University in Brno and the University of Warwick) of the ERC Consolidator Grant *Large discrete structure*, PI: Daniel Kráľ, Project ID: 648509, funded under: H2020, EU contribution total EUR 1 386 859.

The institute also organises the **S. Łojasiewicz Lecture,** an annual event held at the Institute of Mathematics since 2010. The speakers were: S.-T. Yau (a Fields medalist), R. Hamilton, B. Malgrange, N. Trudinger, F. Costa, N. Alon, A. Avila (a Fields medalist), and Luis A. Caffarelli.